Development of a Practice-Oriented Graduate Certificate Program in Nuclear Power Engineering

Executive Summary

A *practice-oriented* graduate certificate program in nuclear power engineering for students pursuing a Master's degree in Mechanical engineering is proposed herein. A distinguishing feature of the proposed program is a significant practical training component to be achieved by: 1) providing participating students the opportunity to engage in a Master's-level cooperative education (Co-op) assignment at any of the program's industrial sponsors for one semester, and 2) our industry partners will be directly engaged in program and course content design and review to facilitate the incorporation of vital nuclear engineering practice knowledge into the course modules, based on forecasted needs of the nuclear power stakeholders. Accordingly, the program courses will be enhanced with a significant experiential learning component through practical, industry-based case-studies to be provided by our industrial partners based on long-term experience of their experts as it relates to design, operation, safety, security, environmental protection, and regulatory standards. The principal investigators have recently established the Innovation Partnership Institute in Clean Energy Technology (IPI-CET) within the Department of Mechanical Engineering at Stevens Institute of Technology. The IPI-CET is guided by a consortium forming a strategic partnership which includes: Stevens Institute of Technology, Bergen Community College, Public Service Enterprise Group (PSEG) Services Company, Burns and Roe Enterprises Inc., Electric Power Research Institute (EPRI), Brookhaven National Laboratory (BNL), PJM Interconnection, and Erin Engineering Company. The main goal of the IPI-CET is to provide solutions to the workforce development challenges within the nuclear power industry for students up to and including the Bachelor's degree level. The proposed graduate certificate program is a natural extension of existing efforts which is expected to increase the pool of students interested in a career within the resurging nuclear power industry and related government agencies (e.g., NRC and DOE laboratories) while significantly reducing the required training of next-generation nuclear power engineering professionals. A long-range goal of the proposed program is its expansion to students from other engineering disciplines including: Chemical Engineering, Civil Engineering, Environmental Engineering, Electrical Engineering, Engineering Physics, and Engineering Management. A *broader impact* is for the program to become a model for adoption at other institutions nationwide.

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